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REMARKS

Claims 1-28 are currently pending in the subject application and are presently under consideration. A clean version of all pending claims is found at pages 5-10. Claims 2, 7, 12, 21-24, and 26-28 have been amended herein. No new matter has been added. A marked-up version of claim amendments made herein is found on pages 22-25 of this Reply.

The specification has been amended to correct typographical errors. A clean version of all replacement paragraphs is found at pages 2-4. No new matter has been added. A marked-up version of the replacement paragraphs is found on pages 19-21 of this Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Objection to the Drawings under 37 CFR 1.84(p)(5)

The Examiner has objected to Figure 2b as failing to comply with 37 CFR 1.84(p)(5) for not including reference sign(s) mentioned in the description. A proposed drawing is provided herewith the correction(s) noted in red. Accordingly, withdrawal of this objection is respectfully requested. New formal drawings incorporating such changes will be filed in a separate paper.

II. Objection to the Specification

The disclosure has been objected to because of an informality at page 23, line 13. It is believed the replacement paragraph submitted herein cures such informality, and withdrawal of this rejection is respectfully requested.

III. Objection to Claims 2, 23, 24 and 28

Claims 2, 23, 24, and 28 have been objected to because of informalities. These informalities have been corrected, as indicated herein. Withdrawal of this objection is requested.

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IV. Rejection of Claims 1-6 Under 35 U.S.C. §112, First Paragraph

Claims 1-6 stand rejected under 35 U.S.C. §112, first paragraph, as containing subject matter not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, the Office Action states that the specification lacks disclosure as to how the "verbs" are related to Figure 1d and a mode for carrying out the modification of the prior art process. Further, the Office Action indicates that the specification does not explicitly state the particular roles of each of the individual variables in representing parallelism or mitigating deadlock within a system.

It is respectfully submitted that this rejection is improper, and that the subject specification would be enabling to one skilled in the art to make and use the invention without undue experimentation. *See In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). *See also United States v. Teletronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) ("The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation."). Furthermore, the test of enablement is not whether any experimentation is necessary, but whether, if experimentation is necessary, it is undue. *In re Angstadt*, 537 F.2d 498, 504, 190 USPQ 214, 219 (CCPA 1976).

In the present specification, sufficient detail is provided to in order for one of ordinary skill in the art to perform the invention without undue experimentation. For example, the specification provides exemplary parameters to guide one of ordinary skill in the art through the claimed methodology recited in claims 1-6 (*e.g.*, it is well known in the art that PI-calculus can be utilized to model processes, and that conventional PI-calculus utilizes one verb to model such process).

V. Rejection of Claims 21, 23, 26 and 27 Under 35 U.S.C. §112, Second Paragraph

Claims 21, 23, 26 and 27 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Appropriate amendments have been

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made herein to claims 21, 23, 26 and 27 in accordance with the Examiner's suggestions. Accordingly, withdrawal of this rejection is respectfully requested.

VI. Rejection of Claims 1-28 Under 35 U.S.C. §101

Claims 1-28 stand rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter.

In particular, the Office Action states that claims 1-6 and 23 are directed toward the manipulation of abstract data, i.e., process algebra verbs and business process operations. Moreover, the Office Action indicates that "a complete disclosure should contain some indication of the practical application for the claimed invention, i.e., why the applicant believes the claimed invention is useful."

Applicants' representative respectfully submits that this rejection is improper for at least the following reasons. The subject claims are directed to statutory subject matter. Nevertheless, applicants' representative has amended some of the subject independent claims to make clear that the claimed invention complies with §101. Moreover, it is readily apparent that the subject specification provides indication of practical applications of the claimed invention.

The specification contains numerous references to practical applications of the disclosed invention in the area of transaction processing, and how the present invention improves upon conventional systems/methods. To wit, the Background section of the application provides an introduction into such applications in transaction processing systems that include, for example, "distributed data for reliability, availability, and performance, and fault tolerant storage and processes, in addition to contributing to a client-server model and remote procedure call for distributed computation." (See page 1, lines 10-13). Any business process can be interpreted as a sequence of basic transactions called workflows. (See page 2, lines 1-2). Workflow applications can be of particular utility in processing business transactions between different companies, and automation of such processes can result in significant improvements in efficiency, not otherwise possible. (See page 1, lines 26-29). However, conventional transaction system models assume transactions are concurrent and are related in such a manner that whether or not a

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transaction commitment has occurred needs to be communicated up a chain to a higher level parent transaction. The fact that a transaction is an independent transaction is not fully considered. (See page 2, lines 15-18).

Business workflow applications can be modeled utilizing a process algebra commonly known as PI-calculus, and a derivative of which is called combinators. (See page 3, lines 9-10). Benefits and improvement provided by the present invention are found in the Summary of the Invention. (See pages 3-6). Accordingly, it is respectfully submitted that the practical application and usefulness of the claimed invention has been clearly conveyed via the subject specification.

In view of at least the above comments and noted amendments, withdrawal of this rejection is respectfully requested.

VII. Rejection of Claims 7-14, 22-25, and 28 Under 35 U.S.C. §102(b)

Claims 7-14, 22-25, and 28 stand rejected under 35 U.S.C. §102(b) as being anticipated by Release 8.0 of the publicly available Workflow Template software product (hereinafter, "Template"). This rejection should be withdrawn for at least the following reasons. Template does not disclose each and every element recited in the respective claims as amended.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Independent claims 7, 12, 22-24 and 28, as amended, recite systems, methods, and software that *utilize a process algebra* as the basis for representing and facilitating modeling of a business process, and which distinguishes more clearly the claimed inventions over Template (which does not teach or suggest such claimed feature of applicants' invention). Accordingly, this rejection should be withdrawn.

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VIII. Rejection of Claim 21 Under 35 U.S.C. §103(a)

Claim 21 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Template as applied to claim 13. Official Notice is taken by the Examiner that it is well-known and commonly practiced in the computer arts at the time the subject invention was made to incorporate a computer readable medium into a computer system in order to allow data transfer between the medium and the system, such as, for example, for the execution of a program embodied in a CD-ROM medium on such a computer system.

It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Claim 21 depends indirectly from independent claim 12. The Official Notice does not make up for the aforementioned deficiencies of Template with respect to claim 12. Accordingly, withdrawal of this rejection is respectfully requested.

IX. Rejection of Claims 15-20 Under 35 U.S.C. §103(a)

Claims 15-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Template as applied to claim 12, and further in view of Chen *et al.* (US 5,940,839). This rejection should be withdrawn for at least the following reasons. Neither Template nor Chen *et al.*, alone or in combination, teach or suggest the claimed invention.

Chen *et al.* teaches a fault-tolerant technique for managing cross-hierarchy failure of a process of transactions. Chen *et al.* integrates nested and flat structured transactions in a transaction hierarchy, where a transaction may represent a block of subtransactions that are connected sequentially, concurrently or conditionally. A subtransaction can further represent an inner block of subtransactions. Thus the transaction execution history is represented in a history tree form, having multilevel blocks. Failure recovery is achieved by taking advantage of the ability to trace any transaction in a process in its corresponding history tree, which represents the execution history of the transaction.

As amended, claim 12 recites “[a] system that uses a process algebra for facilitating modeling of business processes comprised of a plurality of business operations being representable at a transaction level and an action level...”. Chen *et al.* does not teach employing a process algebra in the manner of the claimed invention let

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alone with respect to *at least two variables* (e.g., a plurality of business operations being representable at a transaction level and an action level...). Neither Template nor Chen *et al.* teach or suggest such feature of applicants' claimed invention. Moreover, there is no suggestion or motivation to combine the references in the manner suggested, and even if combined the subject invention would not result.

Accordingly, it is readily apparent that the neither Template nor Chen *et al.* alone or in combination make obvious applicants' claimed invention, and this rejection should be withdrawn.

X. Rejection of Claims 26 and 27 Under 35 U.S.C. §103(a)

Claims 26 and 27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Template as applied to claim 24, and further in view of Ambler *et al.* (US 6,393,456). Since claims 26 and 27 depend from claim 24, the Office Action indicates that although Template discloses such software as in claim 26, having first, second, and third components performing functions in a schedule, Template does not explicitly disclose the software comprising a programmable language having an XML syntax. The Examiner goes on to state that, since Ambler *et al.* discloses such a workflow specification written in XML, it would have been obvious to modify Template to include a programmable language having an XML syntax.

This rejection should be withdrawn for at least the following reasons. Neither Template nor Ambler *et al.*, either alone or in combination, teach the claimed invention. Moreover, there is no suggestion or motivation to combine the references.

Ambler *et al.* teaches a workflow processing architecture that utilizes Internet interoperable electronic messaging with MIME multiple content type. A client computer in a communications network with a server computer assembles a record set that has a MIME declaration header with a multipart content type and a content sub-type indicative of a workflow media type. The first client computer also assembles a binary file having therein an encoded workflow specification. The record set is then transmitted with the binary file to the communications network. A second client computer on the communications network receives both the record set and the binary file and begins

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decoding the workflow specification. The second client computer uses an application program to execute the decoded workflow specification so as to perform all or a portion of the workflow process that is specified therein. The workflow specification is optionally written in XML.

Claim 24, as amended, recites "[a] business process scheduling software generated from a process algebra, the scheduling software represented as computer executable instructions embodied in a computer-readable medium and comprising...". Ambler *et al.* does not teach or suggest a business software generated from process algebra. Therefore, the combination of Template and Ambler *et al.* does not make obvious applicants' invention as recited in the subject claims. This rejection should be withdrawn.

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XI. Conclusion

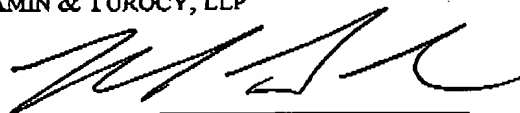
The present application is believed to be condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

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MARKED UP VERSION OF REPLACEMENT PARAGRAPHS

Please replace the paragraph in the Summary of the Invention on page 3, lines 3-20, with the following amended paragraph:

--The present invention relates to a system and methodology of reducing process algebra (employed to facilitate modeling business workflow processes) to a language that facilitates modeling business workflow processes. A typical business workflow process in accordance with the present invention may include a plurality of business processes defined by a number of operations - the operations defining constraints on the business processes. The present invention provides for reducing any of a plurality of conventional process algebra to a model for business workflow applications. For example, combinators[COMbinators] (a λ -calculus derivative) can be employed in modeling a business workflow application. The model is then reduced to an application programming language to allow users to choose between features of the present invention and conventional features associated with modeling application specific business processes. Preferably, the application program language is a scheduling language that may be represented as a graphical user interface program convertible to a schedule written in a programmable language. The present invention facilitates unsophisticated programmers in implementing modeling techniques for specific business workflow processes. The present invention further provides expression for viewing and grouping a workflow schedule separate from any binding associated with a specific implementation and a specific technology, which allows for a common business model to be utilized across a variety of implementations and technologies.--

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Please replace the paragraph on page 12, beginning at line 23, and ending on page 13, line 12, with the following amended paragraph:

--In addition to the above stated features, the model allows for concurrent execution of actions within transactions. Transactions will not commit until a final action within a transaction has completed. The model also allows for explicit determination of transaction boundaries in addition to increased granularity of transactions. For example, transaction (T5) 50 has been defined as having four actions, while transaction (T3) 40 and (T4) 45 has been defined as including three and two[four] actions, respectively. Transaction (T2) 30 has been defined as including transaction (T3) 40, (T4) 45 and (T5) 50, but can be defined as any two of transaction (T3) 40, (T4) 45 and (T5) 50 or simply any of transaction (T3) 40, (T4) 45 and (T5) 50. Therefore, the present invention allows for defining transaction boundaries and increasing granularity. Additionally, actions can happen concurrently independent of isolation because the data that the actions work on are independent of one another. Since isolation of the model has been relaxed to allow for increased granularity, transactions cannot simply be rolled back upon a failure of a single transaction, as is conventional. This is because the data associated with committed interdependent transactions is not locked after commitment, and therefore data may be compromised before another concurrent interdependent transaction fails. Therefore, the present invention allows for compensation to be invoked upon a failure of a transaction or an action. The compensation can be invoked to include compensating tasks for committed interdependent concurrent transactions and all committed transactions and actions outside the parent transaction. However, compensation upon a failure can include any compensating action to be invoked based on a particular application or desire.--

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Please replace the paragraph on page 23, lines 3-17, with the following amended paragraph:

—A partition construct describes a collection of independent concurrent processes. The partition construct allows the users to represent transactions as autonomous independent transactions separate from concurrent interdependent transactions. In the present example, independent refers to the fact that each process in the partition refers to different ports, while concurrent meaning that all the processes in the partition proceed in parallel. Fig. 23a illustrates EBNF notation for a partition construct, while Fig. 23b illustrates the partition construct in XML. A graphical user interface component representing a partition is illustrated in Fig. 23c. A connect construct allows for modeling a simple form of communication between processes. Fig. 24a illustrates EBNF notation for a connect construct, while Fig. 24b illustrates the connect construct in XML. A graphical user interface component representing a connect construct is illustrated in Fig. 24c[43c]. The connect construct allows the users to connect processes. For example, if a source action having a port p and a message m occurs in a connected process that is connected to a sink action having a port q and a message n, the message m from the source action will be received by the sink action as a message n.--

Please replace the paragraph on page 27, lines 38-40 of the Appendix, with the following amended paragraph:

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<!ELEMENT context (transactional?)>
<![1] ATTLIST context
    name ID #REQUIRED>
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MARKED UP VERSION OF AMENDED CLAIMS

Please amend claims 2, 7, 12, 21, 22, 23, 24, 26, 27 and 28 as indicated below.

2. (Amended) The method of claim 1, further comprising a step of representing the business process as constraints on synchronization of the at least one independent operation and the set of interdependent operations by distinguishing between synchronization of the at least one independent operation and[from] synchronization of the set of interdependent operations.

7. (Amended) A system that uses a process algebra for facilitating modeling of business processes comprised of a plurality of business operations being representable at a transaction level and an action level, the system comprising a computer-readable medium that embodies[and] a plurality of computer-executable components, the components comprising:

a user interface component; and

a plurality of model components accessible through the user interface component and adapted to allow a user to create a model of a business process, the plurality of model components comprising a distinguishing model component for distinguishing between concurrent autonomous business operations and concurrent interdependent business operations.

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12. (Amended) A system that uses a process algebra for facilitating modeling of business processes comprised of a plurality of business operations being representable at a transaction level and an action level, the system comprising a computer-readable medium that embodies[and] a plurality of computer-executable components, the components comprising:

a user interface component; and

a plurality of model components accessible through the user interface component, the plurality of model components adapted to facilitate a user in creating a model of a business process, the plurality of components comprising at least one boundary establishing component for defining transaction boundaries.

21. (Amended) The system of claim 13, the computer readable medium[media] residing on a computer system.

22. (Amended) A system that uses a process algebra for facilitating modeling of business processes comprised of a plurality of business operations being representable at a transaction level and an action level, the system comprising a computer-readable medium that embodies[and] a plurality of computer-executable components, the components comprising:

a user interface; and

a plurality of modeling components accessible through the user interface and adapted to allow a user to create a model of a business process, the plurality of components comprising a component for defining concurrent synchronizing constraints as occurring upon completion of the autonomous operations.

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23. (Amended) A method for representing business processes derived from a process algebra as constraints on the synchronization of a plurality of autonomous and interdependent business operations, the method comprising:

distinguishing between synchronization of autonomous concurrent operations and[from] interdependent concurrent operations[.];

expressing synchronization constraints on completion of autonomous concurrent operations; and

associating[allowing association of] transaction operations and groups of business operations.

24. (Amended) A business process scheduling software generated from a process algebra, the scheduling software represented as computer executable instructions embodied in a computer-readable medium and comprising:

a first component for distinguishing between synchronization of autonomous concurrent operations and[from] interdependent concurrent operations[.];

a second component for expressing synchronization constraints on completion of autonomous concurrent operations; and

a third component for associating[association] transaction operations and groups of business operations.

26. (Amended) The software of claim 24, the software comprising a programmable language and the first component, the second component and the third component perform functions in a[the] schedule.

27. (Amended) The software of claim 26[24], the programmable language having an XML syntax.

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28. (Amended) A system that uses a process algebra for representing business processes as constraints on the synchronization of a plurality of autonomous and interdependent business operations, the business processes represented as computer executable instructions embodied in a computer-readable medium, the system comprising:

means for distinguishing between synchronization of autonomous concurrent operations from interdependent concurrent operations[.];

means for expressing synchronization constraints on completion of autonomous concurrent operations; and

means for allowing association of transaction operations and groups of business operations.